UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,781	04/07/2005	Adrian-Gelu Boborodea	ECLE59.010APC	9389

20995 7590 07/05/2006

KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER	
CHRISTENSEN, RYAN S	

ART UNIT	PAPER NUMBER
2856	

DATE MAILED: 07/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/530,781	BOBORODEA ET AL.	
	Examiner	Art Unit	
	Ryan Christensen	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *4-7-2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/1/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the column packed with elastic wires must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

3. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must

be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities: It appears on page three of the specification at line 3 there is a minor typographical error. The internal diameter is indicated as less than "200mm." However, later in the specification and in the claims the internal diameter is indicated as less than 20mm. Appropriate correction is required.

Claim Objections

5. Claim 2 is objected to because of the following informalities: A comma does not appear necessary after "comprises elastic wires"
6. Claim 8 is objected to because of the following informalities: There appears to be a typographical error, a quotation mark appears at the end of the claim.
7. Claim 15 is objected to because of the following informalities: There appears to be a typographical error, a "15" appears after the claim status identifier.
8. Appropriate correction is required.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-3, 5 are rejected under 35 U.S.C. 102(b) as being anticipated by an article entitled "High Density Polyethylene Fraction with Supercritical Propane" (Britto et al.).

11. With respect to claim 1, Britton et al. disclose steel wire mesh used as packing (page 554 last paragraph) in analytical TREF (page 554, right hand column).

12. With respect to claim 2, Britton et al, discloses stainless steel wire mesh as packing. The Young's modulus of steel is inherently greater than 50 Gpa (about 190 GPA).

13. With respect to claim 3, Britton et al, discloses stainless steel wire mesh as packing. Steel inherently has a thermal conductivity higher than 0.1 $Wcm^{-1}K^{-1}$ (about 0.5 $Wcm^{-1}K^{-1}$)

14. With respect to claim 5, Britton et al, discloses stainless steel wire mesh as packing (page 554).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

17. Claims 7-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over an article entitled "High Density Polyethylene Fraction with Supercritical Propane" (Britto et al.) in view of U.S. Patent 4,798,081 (Hazlitt et al.).

18. With respect to claim 7, Britto et al. do not explicitly disclose that the column be made of stainless steel. However, Hazlitt et al. disclose using a column made of stainless steel. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system taught by Britto et al. by using a column made of stainless steel, as disclosed by Hazlitt et al., because stainless steel is well known in the art for the construction of columns in TREF chromatography.

19. With respect to claim 8, Hazlitt et al. further disclose a column under 2mm in diameter and between 50 and 500mm in length (Col. 7, lines 62-68).

20. With respect to claim 9, Britto et al. do not explicitly detail the basic components of a system used in an ATREF chromatography. However, Hazlitt et al. disclose a temperature controlling system (oil bath, 222, Fig. 4A and Col. 8. lines 14-25),

a sample injector for injecting a polymer sample into the column (122, Fig. 2, and Col. 6, lines 54-64), and a detector for detecting elution fractions of said sample (16, Fig. 1and Col. 6, lines 22-30). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system taught by Britto et al. by providing the components described by Hazlitt et al., because it is well known in the art to perform an ATREF with these components.

21. With respect to claim 10, Hazlitt et al. further disclose the detector being a differential refractive index detector (Col. 9, lines 48-66).

22. With respect to claim 11, Hazlitt et al. further discloses providing a column according to claim 1 (see above) and injecting it with a polymer solution (abstract), crystallizing the polymer sample solution in he column over a cooling temperature gradient to produce a crystallized polymer sample (Col. 4, lines 11-16) while keeping solvent flowing through the column (Col. 7, lines 19-25), eluting said crystallized polymer sample by increasing the temperature of said column over a temperature heating gradient to produce eluted fractions of the polymer sample solution, said fractions being eluted as a function of temperature (Col. 4, lines 17-20), and measuring the concentration of the eluted fractions of polymer sample solutions by means of a detector (Col. 4, lines 20-23 and Col. 6, lines 22-30). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system taught by Britto et al. by providing the steps described by Hazlitt et al., because it is well known in the art to perform an ATREF with these steps.

23. With respect to claim 12, Hazlitt et al. further disclose the detector being a differential refractive index detector (Col. 9, lines 48-66).

24. With respect to claim 13, Hazllitt et al. further disclose a temperature controlling system (oil bath, 222, Fig. 4A and Col. 8. lines 14-25).

25. With respect to claim 14, Hazlitt et al. further disclose using less than 2 mg of polymer sample (0.5 mg, Col. 10, lines 59-63).

26. With respect to claim 15, Hazlitt et al. further disclose using less than 1 ml of polymer solution (50cc, Col. 10, lines 59-63).

27. With respect to claim 16, Hazlitt et al. further disclose an injector for automatically injecting the polymer sample solution (122, Fig. 2, and Col. 6, lines 54-64).

28. With respect to claim 17, Hazlitt et al. further disclose the sample polymer is injected at a flow rate lower than 2.0 mL/min (Col. 11, lines 11-27).

29. With respect to claim 18, Hazlitt et al. further disclose a maximum temperature of the cooling gradient under 210 degrees Celsius (Col. 10, line 59 to Col. 11, line 4).

30. With respect to claim 20, Hazlitt et al. further disclose a maximum temperature in the range of up to 210 degrees Celsius (Col. 10, line 59 to Col. 11, line 4)

31. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over an article entitled "High Density Polyethylene Fraction with Supercritical Propane" (Britto et al.) in view of U.S. Patent 3,340,085 (Halasz et al.).

32. With respect to claims 4 and 6, Britto et al. do not explicitly disclose the dimensions relating the wire mesh used as packaging. They neither explicitly

disclose a diameter less than 1mm, a length greater than 2 mm, nor a length to diameter ratio greater than three. Halasz et al. discloses the dimensions of a small stainless steel wire mesh rings (Col. 7, lines 14-15) being 1x1mm (Col. 5, line 4) used in packing for chromatography (astract). The diameter of the ring formed by the wire is 1mm therefor the diameter of the wire is less than 1mm. The circumference around the ring, which is roughly the length of the individual wire is roughly 3.14mm, which is both greater than 2 mm and provides a length to diameter ration greater than three. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system taught by Britto et al. by using a wire mesh with the dimensions disclosed by Halasz et al. because is within the skill of one in the art to determine the appropriate sized mesh to support the crystallization and elution of a polymer in ATREF chromatography.

33. Claims 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination as applied to claim 11 in further view of U.S. Patent 6,770,355 (Minami et al.).

34. With respect to claims 19 and 21, the combination as applied to claim 11 does not explicitly disclose a cooling rate or a heating rate of at least 0.5 degrees Celsius per minute. However, Minami et al. disclose a TREF process including a cooling rate greater than 0.5 degrees Celsius per minute and a heating rate greater than 0.5 degrees Celsius per minute (Col. 28 lines 25-33). It would have been obvious to one of ordinary skill in the art at the time of the invention to

modify the system taught in by 4,798,081 (Hazlitt et al.) by using heating and cooling rates greater than 0.5 degrees Celsius, as disclosed by Minami et al. because ATREF generally uses smaller sample sizes and it would be within the skill of one in the art to determine appropriate heating and cooling rates depending on the polymer sample and to choose the quickest feasible rate in order to obtain results more quickly.

Pertinent Prior Art

35. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 5,030,713 (Wild et al.) discloses an improved process for ATREF.

U.S. Patent 6,780,314 (Jinno et al.) discloses a column packed with fibers which are about 1 mm in diameter and greater than 3 mm in length for use in chromatography.

An article entitled "High Density Polyethylene Fraction with Supercritical Propane" (Britto et al., Journal of Polymer Science: Part B Polymer Physics, Vol. 37, 553-560 (1999)) discloses an apparatus for TREF consisting of a column packed with a support consisting of dense stainless steel mesh packing (pg. 554, last paragraph).

U.S. Patent 3,492,794 (Reynolds et al.) discloses a column for chromatography where the column contains elastic wires. It further discloses that the size of the

wires are determines by the wires are determined by one of skill in the art based on the column size and components being separated.

Conclusion

36. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Christensen whose telephone number is 571-272-2683. The examiner can normally be reached on Monday - Friday, 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RC

DANIEL S. LARKIN
PRIMARY EXAMINER